

REMARKS/ARGUMENTS

This is a preliminary amendment in a RCE application. The Office Action mailed June 30, 2005 has been carefully reviewed. Reconsideration of this application, as amended and in view of the following remarks, is respectfully requested. The claims presented for examination are: claims 1-47.

35 USC 102 Rejection

On pages 2 through 6 of the Office Action mailed June 30, 2005, claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47 were rejected under 35 U.S.C. 102(b) as being anticipated by the Gadefelt (U.S. Patent Number 3,775,971) reference.

The Gadefelt Reference

The Gadefelt reference is illustrated below with text boxes added.

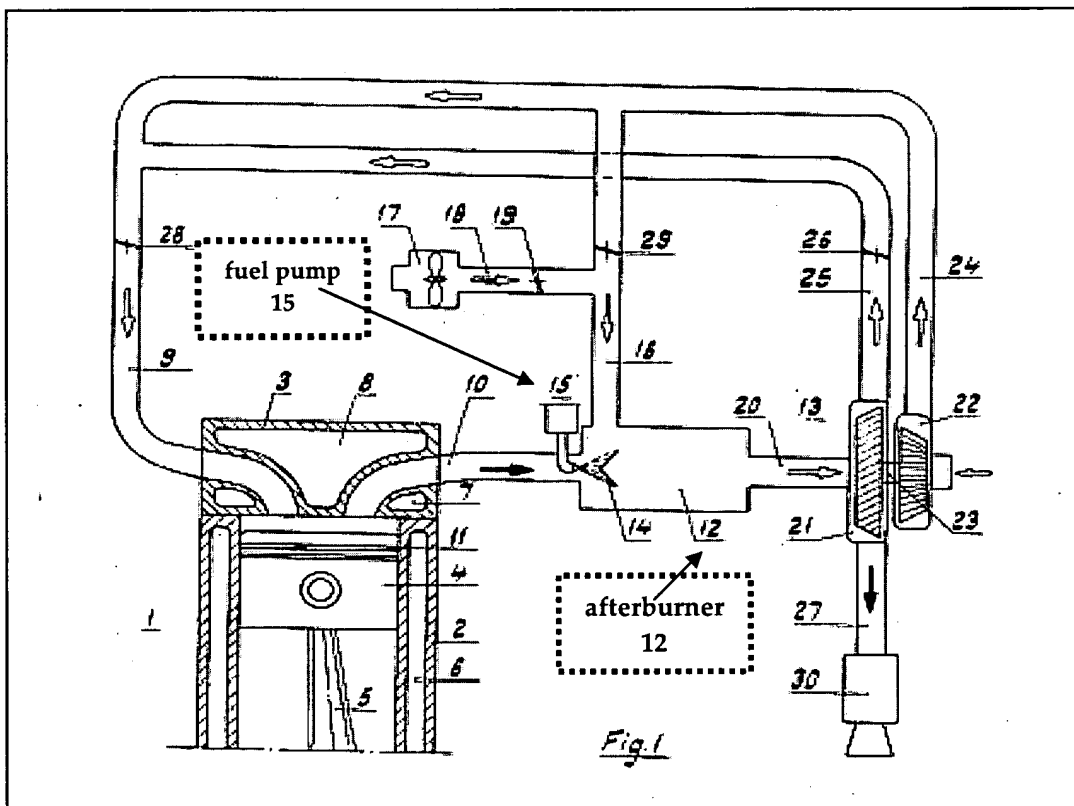
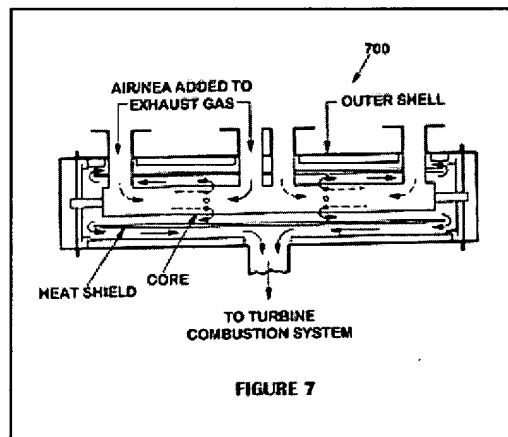
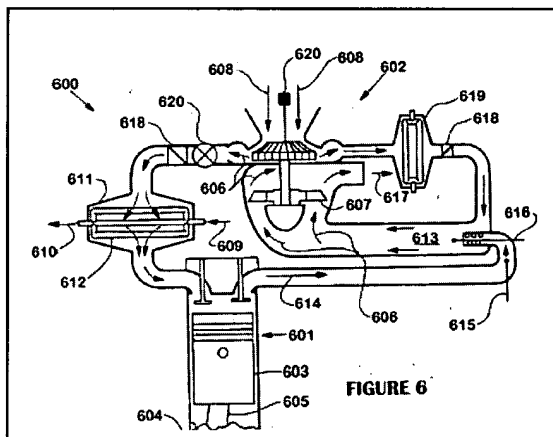


FIG. 1 of the Gadefelt reference is described beginning at col. 2, line 58 of the Gadefelt reference the as follows:

“Illustrated in FIG. 1 is an internal combustion engine of the piston type of which only a cylinder 2, a cylinder block 3, a piston 4 and a connecting rod 5 is shown. Accordingly, the illustrated embodiment of the system includes an afterburner 12 and a supercharging unit 13 connected to the exhaust outlet pipe 10 of the engine. The afterburner 12 is of conventional type provided with a nozzle 14 securely mounted to one end thereof. A fuel pump 15 is connected to the outlet pipe 10 and is arranged to inject fuel into the afterburner 12. ...”

Applicants’ Claimed Invention

The invention defined by Applicant’s amended claims is described in Appellants’ original specification and drawings. Appellants’ original application was published as United States Patent Application No. 2004/0055298. The text of Appellants’ original application below is cited with paragraphs in brackets [....] according to Application No. 2004/0055298.



[0056] Referring now to FIG. 6, another embodiment of a combustion method and system is illustrated with a turbine engine supercharger combined with a reciprocating SI or CI engine. This embodiment is designated generally by the reference numeral 600. The piston engine 601 includes a piston 603 in a piston chamber 604 driven by a piston rod 605. The exhaust gases 606 from the piston engine are provided to the turbine engine 602. The turbine engine 602 includes a turbine 607 and an air intake 608. The exhaust gases 606 from the turbine 607 are used to

compress the air before it goes into the piston engine 601. Fuel rich exhaust 614 is directed into combustion chamber 613.

[0057] Referring to FIG. 7, a mixing unit 700 can be added between the piston engine and turbine engine. The mixing unit 700 is used to promote mixing of the piston engine fuel rich hot exhaust gases with air/NEA. The mixing process makes a well-stirred fuel and oxidizer mixture to improve the combustion process in the turbine combustion chamber. The mixing unit is designed to increase residence time for the mixing by suitably arranging the flow paths. The mixing unit can also be designed to promote turbulent mixing and reduce heat losses in the mixing process.

[0059] The primary combustion occurs in the reciprocating engine and is fuel rich, that is, at an equivalence ratio greater than 1.0 to provide a reducing atmosphere to reduce or eliminate NO_x formation. The primary combustion exhaust gases will have fuel molecules such as HC, CO and H₂ in sufficient amounts such that they can be burned in the combustion chamber of the turbine engine. The secondary combustion occurs at or near stoichiometric conditions at a lower combustion temperature where NO_x is difficult to form. The burned gases from the secondary combustion drive a turbine that in turn drives a compressor that supercharges the piston engine and provides compressed air for the secondary combustion. Nitrogen enriched air can be used in the primary or secondary combustion process to better control the combustion temperature and products.

Argument

Applicant has amended independent claims 1, 8, and 16 presented for examination; therefore, claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47 are now presented in amended form. Since claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47 now appear in amended form the 35 USC §102(b) rejection in the Office Action mailed June 30, 2005 no longer applies.

Applicants submit that the invention claimed in claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47 is not anticipated by the Gadefelt reference. The standard for a 35 USC §102 rejection is stated in Verdegaal Bros. v. Union Oil Co of California, 814 F.2nd 628, 631 USPQ 1051, 1053 (Fed. Cir. 1987),

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference."

The Gadefelt reference does not show various structural and step elements of claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47. Nor does the Gadefelt reference show and the combination of structural and step elements in claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47.

Applicant points out that the following elements of Applicants' claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47 are not found in the Gadefelt reference:

"fuel consisting of a first portion and a second portion," or

"fuel, said fuel made up of a first portion and a second portion," or

"means for combusting said first portion of said fuel in said a first stage piston engine in a first stage producing fuel rich piston engine exhaust gases with said piston engine exhaust gases containing said second portion of said fuel;" or

"a first stage piston engine for combusting said first portion of said fuel in a first stage, said first stage piston engine producing piston engine exhaust gases with said piston engine exhaust gases containing said second portion of said fuel;" or

"means for combusting said second portion of said fuel contained in said fuel rich piston engine exhaust gases in said second stage turbine engine at stoichiometric conditions producing turbine engine exhaust gases;" or

"a second stage turbine engine for combusting said second portion of said fuel contained in said piston engine exhaust gases in a second stage at stoichiometric conditions, said second stage turbine engine producing turbine engine exhaust gases;" or

"combusting said first portion of said fuel in a piston engine in a first stage, said step of combusting said first portion of said fuel in a piston engine in a first stage producing piston engine exhaust gases, said piston engine exhaust gases containing said second portion of said fuel;" or

“combusting said second portion of said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions, said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions producing turbine engine exhaust gases.”

Since neither the various structural and step elements of claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47 nor the combination of structural and step elements in claims 1-4, 16-17, 19, 21-22, 25, 26, 28, 30, 32, 33, 35, 38-45, and 47 described above are found in the Gadefelt reference, the Gadefelt reference would not support a 35 USC §102(a) rejection.

35 USC 103 Rejection - Gadefelt in View of Marin et al

On pages 6 and 7 of the Office Action mailed June 30, 2005, claims 5-7 and 36-37 were rejected under 35 U.S.C. 103(a) as obvious over the Gadefelt (U.S. Patent Number 3,775,971) reference in view of the Marin et al (Pub. No. 2003/0101725).

Applicant has amended independent claims 8 and 16; therefore, claims 5-7 and 36-37 are now presented in amended form. Since claims 5-7 and 36-37 now appear in amended form the 35 USC §103(a) rejection in the Office Action mailed June 30, 2005 no longer applies.

Applicants believe that claims 5-7 and 36-37 are patentable and that the Gadefelt and Marin et al references would not support a 35 USC §103(a) rejection. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) include “Ascertaining the differences between the prior art and the claims at issue.”

The differences between the primary Gadefelt reference and Applicants’ invention defined by amended claims 5-7 and 36-37 includes the fact that the

following elements of amended claims 5-7 and 36-37 are not found in the primary Gadefelt reference:

“fuel consisting of a first portion and a second portion,” or

“means for combusting said first portion of said fuel in said a first stage piston engine in a first stage producing fuel rich piston engine exhaust gases with said piston engine exhaust gases containing said second portion of said fuel;” or

“means for combusting said second portion of said fuel contained in said fuel rich piston engine exhaust gases in said second stage turbine engine at stoichiometric conditions producing turbine engine exhaust gases;” or

“combusting said first portion of said fuel in a piston engine in a first stage, said step of combusting said first portion of said fuel in a piston engine in a first stage producing piston engine exhaust gases, said piston engine exhaust gases containing said second portion of said fuel;” or

“combusting said second portion of said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions, said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions producing turbine engine exhaust gases.”

The Marin et al reference also fails to show the elements of claims 5-7 and 36-37 identified above. Since both references fail to show the elements, there can be no combination of the two references that would show Applicant's invention defined by amended claims 5-7 and 36-37 and render them unpatentable. There is no combination of the Gadefelt reference and the Marin et al reference that would produce the combination of elements of Applicants' amended claims 5-7 and 36-37. Further, there is no teaching of combining the Gadefelt reference and the Marin et al reference to meet Applicants' amended claims 5-7 and 36-37. Thus, the combination of references fails to support a rejection of the claims under 35 USC 103, and the rejection should be withdrawn.

Under MPEP §2142, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. It should be noted that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Since there is no suggestion or motivation to combine the references to produce Applicant's invention, a 35 U.S.C §103(a) rejection of Applicant's claims would not be appropriate.

The Gadefelt Reference Teaches Away from the Claimed Invention

Applicants' claimed invention and the Gadefelt device are very different and operate completely different. In the Gadefelt device an afterburner 12 and fuel pump 15 are connected to a piston type engine. In applicants' claimed invention the first portion of the fuel is combusted producing fuel rich piston engine exhaust gases containing the second portion of the fuel which is combusted in a second stage turbine engine at stoichiometric conditions. The Gadefelt reference does not disclose Applicants' fuel rich piston engine exhaust gases. In fact the Gadefelt reference teaches away from Applicants' claimed invention because fuel from fuel pump 15 is added. The Gadefelt reference does not disclose Applicants' fuel combusted in a second stage turbine engine at stoichiometric conditions. In fact the Gadefelt reference teaches away from Applicants' claimed invention. In the Gadefelt reference, adding fuel from fuel pump 15 teaches away from all fuel being combusted.

35 USC 103 Rejection - Gadefelt in View of Melchior

On pages 7 and 8 of the Office Action mailed June 30, 2005, claims 18, 23, 29, and 46 were rejected under 35 U.S.C. 103(a) as obvious over the Gadefelt (U.S.

Patent Number 3,775,971) reference in view of the Melchior (U.S. Patent No. 4,233,815).

Applicant has amended independent claim 16; therefore, claims 18, 23, 29, and 46 are now presented in amended form. Since claims 18, 23, 29, and 46 now appear in amended form the 35 USC §103(a) rejection in the Office Action mailed June 30, 2005 no longer applies.

Applicants believe that claims 18, 23, 29, and 46 are patentable and that the Gadefelt and Melchior et al references would not support a 35 USC §103(a) rejection. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) include "Ascertaining the differences between the prior art and the claims at issue."

The differences between the primary Gadefelt reference and Applicants' invention defined by amended claims 18, 23, 29, and 46 includes the fact that the following elements of amended claims 18, 23, 29, and 46 are not found in the primary Gadefelt reference:

"combusting said first portion of said fuel in a piston engine in a first stage, said step of combusting said first portion of said fuel in a piston engine in a first stage producing piston engine exhaust gases, said piston engine exhaust gases containing said second portion of said fuel;" or

"combusting said second portion of said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions, said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions producing turbine engine exhaust gases."

The Melchior et al reference also fails to show the elements of claims 18, 23, 29, and 46 identified above. Since both references fail to show the elements, there can be no combination of the two references that would show Applicant's

invention defined by amended claims 18, 23, 29, and 46 and render them unpatentable. There is no combination of the Gadefelt reference and the Melchior et al reference that would produce the combination of elements of Applicants' amended claims 18, 23, 29, and 46. Further, there is no teaching of combining the Gadefelt reference and the Melchior et al reference to meet Applicants' amended claims 18, 23, 29, and 46. Thus, the combination of references fails to support a rejection of the claims under 35 USC 103, and the rejection should be withdrawn.

Under MPEP §2142, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. It should be noted that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Since there is no suggestion or motivation to combine the references to produce Applicant's invention, a 35 U. S. C §103(a) rejection of Applicant's claims would not be appropriate.

35 USC 103 Rejection - Gadefelt in View of Becker et al

On pages 8 and 9 of the Office Action mailed June 30, 2005, claims 31 and 34 were rejected under 35 U.S.C. 103(a) as obvious over the Gadefelt (U.S. Patent Number 3,775,971) reference in view of the Becker et al (U.S. Patent No. 4,233,815).

Applicant has amended independent claim 16; therefore claims 31 and 34 are now presented in amended form. Since claims 31 and 34 now appear in amended form the 35 USC §103(a) rejection in the Office Action mailed June 30, 2005 no longer applies.

Applicants believe that claims 31 and 34 are patentable and that the Gadefelt and Becker et al references would not support a 35 USC §103(a)

rejection. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) include “Ascertaining the differences between the prior art and the claims at issue.”

The differences between the primary Gadefelt reference and Applicants’ invention defined by amended claims 31 and 34 includes the fact that the following elements of amended claims 31 and 34 are not found in the primary Gadefelt reference:

“combusting said first portion of said fuel in a piston engine in a first stage, said step of combusting said first portion of said fuel in a piston engine in a first stage producing piston engine exhaust gases, said piston engine exhaust gases containing said second portion of said fuel;” or

“combusting said second portion of said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions, said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions producing turbine engine exhaust gases.”

The Becker et al reference also fails to show the elements of claims 31 and 34 identified above. Since both references fail to show the elements, there can be no combination of the two references that would show Applicant’s invention defined by amended claims 31 and 34 and render them unpatentable. There is no combination of the Gadefelt reference and the Becker et al reference that would produce the combination of elements of Applicants’ amended claims 31 and 34. Further, there is no teaching of combining the Gadefelt reference and the Becker et al reference to meet Applicants’ amended claims 31 and 34. Thus, the combination of references fails to support a rejection of the claims under 35 USC 103, and the rejection should be withdrawn.

Under MPEP §2142, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. It should be noted that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Since there is no suggestion or motivation to combine the references to produce Applicant's invention, a 35 U.S.C §103(a) rejection of Applicant's claims would not be appropriate.

35 USC 103 Rejection - Gadefelt in View of Anne Stark or Sekar et al

On pages 9 and 10 of the Office Action mailed June 30, 2005, claims 31 and 34 were rejected under 35 U.S.C. 103(a) as obvious over the Gadefelt (U.S. Patent Number 3,775,971) reference in view of Anne Stark or Sekar et al (U.S. Patent No. 5,526,641).

Applicant has amended independent claim 16; therefore, claims 31 and 34 are now presented in amended form. Since claims 31 and 34 now appear in amended form the 35 USC §103(a) rejection in the Office Action mailed June 30, 2005 no longer applies.

Applicants believe that claims 31 and 34 are patentable and that the Gadefelt and Anne Stark or Sekar et al references would not support a 35 USC §103(a) rejection. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966) that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) include "Ascertaining the differences between the prior art and the claims at issue."

The differences between the primary Gadefelt reference and Applicants' invention defined by amended claims 31 and 34 includes the fact that the

following elements of amended claims 31 and 34 are not found in the primary Gadefelt reference:

“combusting said first portion of said fuel in a piston engine in a first stage, said step of combusting said first portion of said fuel in a piston engine in a first stage producing piston engine exhaust gases, said piston engine exhaust gases containing said second portion of said fuel;” or

“combusting said second portion of said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions, said step of combusting said fuel contained in said piston engine exhaust gases in a second stage turbine engine at stoichiometric conditions producing turbine engine exhaust gases.”

The Anne Stark or Sekar et al reference also fails to show the elements of claims 31 and 34 identified above. Since both references fail to show the elements, there can be no combination of the two references that would show Applicant's invention defined by amended claims 31 and 34 and render them unpatentable. There is no combination of the Gadefelt reference and the Anne Stark or Sekar et al reference that would produce the combination of elements of Applicants' amended claims 31 and 34. Further, there is no teaching of combining the Gadefelt reference and the Anne Stark or Sekar et al reference to meet Applicants' amended claims 31 and 34. Thus, the combination of references fails to support a rejection of the claims under 35 USC 103, and the rejection should be withdrawn.

Under MPEP §2142, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. It should be noted that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20

USPQ2d 1438 (Fed. Cir. 1991). Since there is no suggestion or motivation to combine the references to produce Applicant's invention, a 35 U.S.C §103(a) rejection of Applicant's claims would not be appropriate.

SUMMARY

In applicants' claimed invention the first portion of the fuel is combusted producing fuel rich piston engine exhaust gases containing the second portion of the fuel which is then combusted in a second stage turbine engine at stoichiometric conditions. In the Gadefelt device an afterburner 12 and fuel pump 15 are used. The Gadefelt reference does not disclose Applicants' fuel rich piston engine exhaust gases or Applicants' fuel combusted in a second stage turbine engine at stoichiometric conditions. In the Gadefelt reference added fuel from fuel pump 15 teaches away from Applicants' fuel rich piston engine exhaust gases and stoichiometric conditions.

It is respectfully requested that this application be reconsidered, that the claims be allowed, and that this case be passed to issue. If it is believed that a telephone conversation would expedite the prosecution of the present application, or clarify matters with regard to its allowance, the Examiner is invited to call the undersigned attorney at (925) 424-6897.

Respectfully submitted,



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